Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

READING IN THE ELEMENTARY SCHOOLS OF INDIANAPOLIS, II.

WILLIAM S. GRAY

RESULTS OF THE ORAL-READING TESTS

Fourteen hundred eighty-four pupils were tested in oral reading in fifteen schools of Indianapolis. In selecting the schools to be tested, the following conditions were observed: (1) that one school in each supervisory district be tested; (2) that the schools tested represent all sections of the city; (3) that schools representing different nationalities, races, and economic levels be included; (4) that schools in which special experiments in reading had been under way, if any, be included; and (5) that the final list chosen represent as fairly as possible the entire school system. The B sections of each grade above the first were tested, inasmuch as they were just beginning the work of the year. The pupils who were tested were selected from the alphabetical list of names of each grade tested. The pupil whose name appeared at the head of the list and every fifth pupil there after were selected. After a list had been canvassed once the second pupil in the list and every fifth pupil thereafter were chosen. The list was canvassed as many times as were necessary to secure the names of fifteen pupils.

The tests were given by thirty seniors of the normal-training class under the immediate and skilful supervision of Miss Mary Pasho, one of the normal-training teachers who had been carefully trained for her work. The students were called to a number of conferences and were carefully instructed in regard to the methods of giving the reading tests. Several pupils were tested in their presence and each step was carefully explained. Each student was required to make several preliminary tests until he had developed sufficient skill to secure reliable results. After a week of careful direction and supervision the students were well qualified to give the tests, as evidenced by the carefully filled test sheets which were returned by them.

The material for the oral-reading test consisted of a series of twelve short passages arranged in the order of increasing difficulty. These passages had been carefully selected from readers, textbooks, and current literature. The arrangement of the passages and the steps of difference in difficulty had been previously determined after several thousand pupils had been tested. The derivation and validity of the tests are described in Monograph No. 1, Volume I, of the Supplementary Educational Monographs entitled "Studies of Elementary School Reading Through Standarized Tests" by William S. Gray. The tests were given in each school by two students under as nearly uniform conditions as possible. As a pupil read, the teacher recorded the time required to read each paragraph and the number of errors of the following types which were made:

a) Gross mispronunciations including all errors in pronunciation which indicated clearly that the word was too difficult for the pupil to pronounce.

b) Minor mispronunciations, which included the mispronunciation of a portion of a word, wrong accent, wrong syllabification, omission of a portion of a word, etc.

c) Omission of words.

d) Insertion of words.

e) Repetition of words or groups of words.

f) Substitution of one word or group of words for another.

A pupil continued to read until he had made seven or more errors in each of two paragraphs.

No estimate of the quality of oral reading was made in this investigation for two reasons. In the first place, previous investigations have shown that it is very difficult to define the various elements which make up quality of oral reading on a basis which is acceptable to a large number of teachers; in the second place, it has been found that the scores given to pupils by the methods employed in this study correspond very closely to the teacher's estimate of the quality of the reading of different pupils. For illustration, the principals who gave the oral-reading tests in connection with the Grand Rapids survey were asked to make a record of the quality of the reading in terms of A, B, or C. If the reading was very well done, this fact was indicated by placing an "A" before the paragraph. If, on the other hand, the reading was very poorly done, the fact was indicated by placing a "C" before the paragraph. These records of quality showed that the time records and records of errors can be relied on as satisfactory measures of the pupil's reading ability. In nearly every case a pupil received a quality mark of "A" if the paragraph was read at a normal rate with not more than one or two errors. On the other hand, as the number of errors increased and as the rate of reading decreased, the quality marks recorded were "B's" or "C's". These results suggest that when pupils read very poorly the reason may usually be sought in the fact that they have been assigned material which presents too many difficulties for them.

The oral-reading scores which are used in this report are calculated on the basis of the time required to read a paragraph and the number of errors made. The reduction of each child's record to a simple numerical statement is based on a system of scoring which expresses in quantitative terms the fact that a paragraph is read in a certain amount of time with a limited number of errors. If now the pupil exceeds the amount of time which has been found in earlier investigations to be common and if the number of errors increases, the amount of credit which he gets for reading a paragraph should be proportionately reduced. The final score for an individual is found by calculating the total amount of credit due the pupil on all paragraphs which he reads. The average class score is found by calculating the arithmetical average of all individual scores in the class.

An additional word of explanation is necessary in regard to the scoring. Inasmuch as many of the tests were given at the close of the school year in Cleveland and in St. Louis, it was necessary, in the case of Indianapolis to make some readjustments in order to secure comparable groups. It was, therefore, decided to consider that the pupils who were just beginning a grade in the autumn of 1917 were comparable in school accomplishment to pupils who were completing the preceding grade in the spring of the same year. Thus the tests of *2B* pupils as they were classified in the autumn of 1917 were scored as if the pupils were *1A* pupils. The grades which were tested will be referred to throughout this report by the section to which they belonged at the close of school the preceding spring. It must be admitted that this plan does not insure exact comparability. Pupils in the lower grades unquestionably decrease in reading ability during the summer months, and it is quite probable that if the pupils who were tested in the autumn of 1917 had been tested the preceding spring their scores would have been higher. Nevertheless, the plan described above was adopted because it afforded the most accurate basis for comparision to which the data lend themselves.

The average oral-reading scores for each grade in which the tests were given appear in Table IV. The average score for each grade of the city is indicated at the foot of the table. The various schools tested are designated by letters. After the scores had been determined the schools were arranged in order on the basis of the oral-reading scores made by the *1A* grades. Letters were then substituted for the names of the schools in the order suggested above. Attention should be called to the fact that the order in which the schools are listed bears no direct relation to their general achievement in oral reading except in the case of the first grade.

The table shows that there is wide variation in the achievement of pupils in the same grade in different schools. The scores for the *1A* grades vary from 6.3 to 30.7. While the higher scores are very much to be desired, nevertheless the schools which make poor scores should not be condemned on the basis of these scores. There are numerous factors which make for good and poor results other than skilful teaching technique. Some of these factors are the economic environment of children, the reading materials which are available,

TABLE IV

Average Oral-reading Scores for Fifteen Schools of Indianapolis

School	Grade						
	1A	2A	3A	4A	5A	6A	7A
A	6.3	36.9	45.2	48.5	48.0	52.9	50.2
B	6.8	35.8	41.1	40.5	43.6	51.0	48.5
C	7.8	31.4	42.0	45.7	43.1	52.2	47.5
D	8.8	17.2	29.8	37.4	39.3	45.8	48.3
E	10.0	13.8	33.9	41.0	41.8	46.8	46.2
F	10.8	26.3	33.8	42.4	45.6	45.2	46.3
G	11.3	42.2	49.0	52.0	56.9	54.8	50.8
H	12.8	44.2	45.5	52.3	51.0	50.4	48.1
I	13.3	28.8	34.8	31.9	42.9	45.1	45.0
J	14.6	24.2	31.9	37.4	43.6	43.6	44.4
K	16.2	41.1	36.5	43.0	45.3	45.0	40.1
L	16.3	24.7	40.8	42.6	46.4	43.0	47.6
M	16.7	35.0	46.3	49.3	50.0	56.9	56.8
N	20.3	34.1	38.0	50.4	48.8	49.2	40.3
O	30.7	33.2	34.6	43.2	41.0	46.0	43.9
Average	13.5	31.3	39.6	43.9	45.8	48.4	47.0

the conditions under which pupils study and read outside of school hours, the language spoken in the home, etc. Low scores are symptoms of conditions which should be studied further in order to determine the most effective remedial steps.

The relation of economic conditions to achievement in reading is brought out in a very interesting way in Table IV. Schools C, G, H, and M were classified as "Very Good" schools in regard to economic conditions by school officers of Indianapolis. Schools G, H, and M rank very high in oral-reading ability. The fact that School C, which is of equal rank from an economic point of view, does not rank so high in achievement as Schools G, H, and M indicates that there are factors other than economic conditions which determine success in reading. Schools A, E, F and L were ranked as "Fair" in regard to economic conditions. It is evident that these schools rank lower in oral-reading ability than the schools of the first group mentioned. The fact that School A ranks relatively high indicates that it is possible for some factor such as skilful instruction to overcome many of the handicaps which accompany less favorable economic conditions. Schools B and K rank low both in economic conditions and in reading achievement.

The facts which have just been referred to suggest the advisability of making careful studies of the conditions prevailing in schools in poor economic surroundings to determine steps which might be taken to insure more effective results. Doubtless the pupils are not well supplied with books in their homes. This suggests the need for more supplementary material, more co-operation with the public library, and the rapid development of school libraries in which the pupils can secure books liberally and in which they can read under favorable physical conditions. In many cases it will be found that children come from homes in which a foreign language is spoken. In such cases simple selections must be chosen more frequently and more attention must be given to the development of effective language habits. Furthermore, schools may be found in which the pupils have encountered very narrow fields of experience. In many cases this experience gives the pupil little direct help in understanding the world-wide experiences to which his books introduce him. Until a pupil has had an opportunity through extensive reading to build up a broad background of experience only selections of a very simple character should be assigned to him.

The average results for Indianapolis and for seven selected schools are presented in Diagram 5. A word of explanation is necessary in order that the diagrams in which the results are presented may be readily understood. Ability to read a certain paragraph without errors means less on the part of a pupil in the upper grades than on the part of a pupil in the lower grades. Grades must be compared with each other, therefore, by recognizing different levels of achievement. These different levels, as determined from previous studies, can be expressed graphically by the vertical lines in the separate figures of Diagram 5. Each vertical line represents the scale for a grade and begins below at the point where a score of 10 should be recorded. Higher scores can be represented by appropriate distances along the vertical line above 10. Each vertical line ends above at a point where the score of 70 belongs. The oblique lines represent the average scores by grades for four cities and seven individual schools.

The upper left-hand figure in Diagram 5 presents the average oral-reading scores for 1,484 pupils of Indianapolis, 10,526 pupils of St. Louis, 4,066 pupils of Grand Rapids, and 2,193 pupils of Cleveland. The diagram shows clearly that at the beginning of the school year in 1917 the pupils of Indianapolis ranked lower on the whole than did comparable groups of pupils in Cleveland and St. Louis at the close of previous school years. The deficiency is more pronounced in the lower grades than in the upper grades. No final conclusion can be drawn from this comparision concerning the adequacy of the reading instruction in Indianapolis because of the influence of the following important factors: (1)

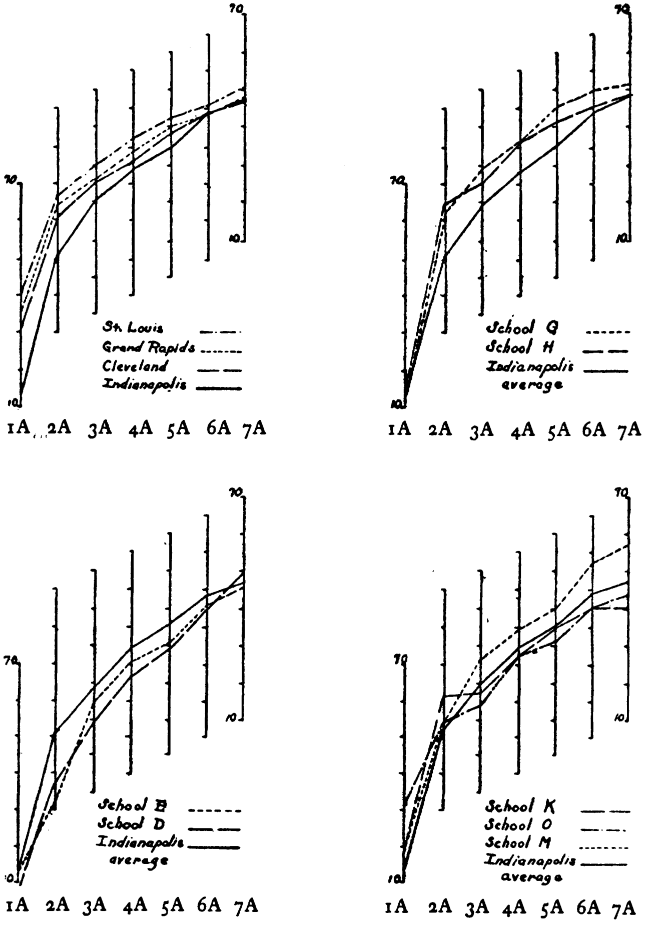

DIAGRAM 5. Average Scores in Oral Reading for Four Cities and for Seven Selected Schools of Indianapolis.

Indianapolis gives much less time to reading instructions per year than does Cleveland, Grand Rapids, or St. Louis. (2) The tests were given at the beginning of the school year after many of the lower-grade pupils had read but little for two or three months. (3) The pupils who were tested were chosen from the entire number enrolled at the beginning of the school year. Hence it cannot be affirmed that the scores are due entirely to the instruction which is given in Indianapolis. The significant fact brought out in the diagram is that Indianapolis is confronted with a tremendous problem, if by the end of the present school year it secures results in oral reading in the lower grades comparable to those secured at the end of the year by other cities. Furthermore, pupils who are just beginning the second grade in Indianapolis do not score so high as did the pupils of Grand Rapids who had been in school only six months, nor so high as the *1B* pupils of St. Louis who had been in school only four months. These statements should challenge the attention of each teacher in the lower grades and should call forth intensive, constructive effort during the coming year. In order to determine accurately the amount of progress which results, it is recommended that teachers look forward to a systematic study of achievement in oral reading in the lower grades at the close of the year. It is only in this way that the effectiveness of instruction in oral reading in Indianapolis can be accurately determined.

The upper right-hand figure in Diagram 5, presents the average scores of School G and School H. The diagram indicates that the high scores of St. Louis and Grand Rapids are easily achievable in Indianapolis, with the possible exception of the scores for the first grade. The lower left-hand figure presents the consistently low scores of School E, and School D. Doubtless there are retarding influences in School D and School E which are not active in School G and School H.

It will be recalled that School G, and School H, were ranked as "Very Good" from an economic point of view and that School E, was ranked as "Fair." The data secured in this investigation do not reveal additional explanations for differences in achievement in these schools. It is the function of a progressive school system, however, to locate points of strength and weakness, and to carry forward investigation far enough to determine the contributing causes.

The lower right-hand diagram presents the records of schools which make varying types of progress. School M makes an average record at the outset and improves gradually until it reaches an unusually high level of achievement in the upper grades. School O, on the other hand, attains a very high level in the first grade but progresses less rapidly through the intermediate grades. School K makes somewhat irregular progress at various points in the grades. The results secured by the seven schools just described differ widely in many respects. Unquestionably they differ in aims, methods of instruction, skill in presentation, kind of pupils, etc. The presence of such conditions in a school system makes imperative the frequent checking of results and the thorough study of the changes which are necessary in particular schools to improve the results of instruction. The co-operation of teachers and supervisors will be necessary in the work, for it is only when all of the units of a school system work together consistently toward clearly defined ends that the most effective results can be secured.

RATE AND ACCURACY IN ORAL READING

As has already been stated, the oral-reading scores are based on the number of seconds required to read each paragraph, and on the number of errors made. Differences in achievement must, therefore, be attributed to differences in the ability of pupils in one or both of these phases of reading ability. In order to determine the relative emphasis given to rate and accuracy, the time required to read and the number of errors made by each pupil in reading paragraphs 1, 4 and 8 were recorded separately by grades. All records were omitted on which individual pupils failed to attain some degree of success. The average number of seconds required by pupils of

TABLE V

AVERAGE RATE OF ORAL READING AND AVERAGE NUMBER OF ERRORS ON PARAGRAPH 1, PARAGRAPH 4, AND PARAGRAPH 8, CLEVELAND, ST. LOUIS, AND INDIANAPOLIS

GRADE	CLEVELAND			ST. LOUIS			INDIANAPOLIS		
	NUMBER OF			NUMBER OF			NUMBER OF		
	Pupils	Seconds	Errors	Pupils	Seconds	Errors	Pupils	Seconds	Errors
Paragraph 1									
1A	223	1.37	1.84	315	1.11	1.81	72	.81	2.17
2A	316	2.06	1.31	410	2.06	.77	187	1.45	1.83
3A	328	2.70	.72	325	2.49	.57	208	2.30	1.36
4A	323	3.05	.65	281	3.07	.37	211	2.76	1.15
5A	242	3.34	.64	17	2.97	.29	206	3.02	.82
6A	216	3.53	.56	22	3.18	.18	210	3.28	.61
7A	220	3.32	.44	20	3.23	.20	210	3.33	.66
Paragraph 4									
1A	80	1.45	2.86	79	1.02	2.78	......	....	......
2A	258	1.79	2.26	365	1.84	1.77	93	1.48	2.87
3A	307	2.39	1.90	420	2.29	1.58	175	1.93	2.73
4A	312	2.75	1.84	430	2.79	1.16	199	2.47	2.26
5A	231	3.05	1.71	407	2.84	1.11	204	2.81	2.14
6A	208	3.40	1.59	395	3.13	.94	210	3.14	1.61
7A	221	3.43	1.37	388	3.45	.93	209	3.28	1.32
Paragraph 8									
3A	137	1.74	3.83	82	1.68	3.46	21	1.32	4.33
4A	229	2.07	3.00	256	1.82	2.99	77	1.73	3.51
5A	196	2.31	2.42	333	1.95	2.10	140	2.02	2.83
6A	197	2.55	2.10	369	2.15	2.08	192	2.21	2.39
7A	215	2.53	1.90	378	2.46	1.40	202	2.31	1.96

Indianapolis to read each paragraph and the average number of errors made are recorded by grades for paragraphs 1, 4 and 8 in Table V. Similar records for Cleveland and St. Louis are also presented.

Before drawing any conclusions concerning the relative efficiency of Indianapolis in speed and accuracy of oral reading a word of explanation is necessary concerning the importance of these two factors. Rate in itself is a fair measure of the mastery which the reader has of the printed page. The poor reader is the one who is unable to pass readily from the printed symbol to its meaning and pronunciation. For the poor reader the mere mechanical processes are obstacles, and he loses time in trying to perform the preliminary mental acts which are necessary before he can comprehend the meaning of, or pronounce, the words. In the case of the good reader, on the other hand, the mechanics of the process are very fluent and rapid. The proficient reader has mastered the necessary associations and moves forward quickly and accurately. It is unnecessary to emphasize the importance of securing that type of improvement which is characterized by increase in in rate and decrease in errors. Inasmuch as one pupil might read very slowly but accurately, and a second pupil might read rapidly but inaccurately, it is necessary to include both rate and accuracy in any thoroughgoing study of achievement in the mechanics of oral reading.

The facts of the table are brought out clearly in Diagram 6. The left-hand figures in the diagram relate to the rate of reading, and the right-hand figures relate to accuracy or freedom from errors. Attention is directed for the moment to the figures relating to rate. The pupils of Indianapolis improve steadily throughout the grades in the rate at which they read simple paragraphs, such as paragraph 1. They read less rapidly in the lower grades than do the pupils of Cleveland or St. Louis, but attain approximately the same rate in the fifth grade. Similar statements may be made concerning the rates at which they read paragraph 4, and paragraph 8. An examination of the figures relating to accuracy reveals some striking facts. The figure for paragraph 1 shows that the pupils of Indianapolis are less accurate throughout the grades than are

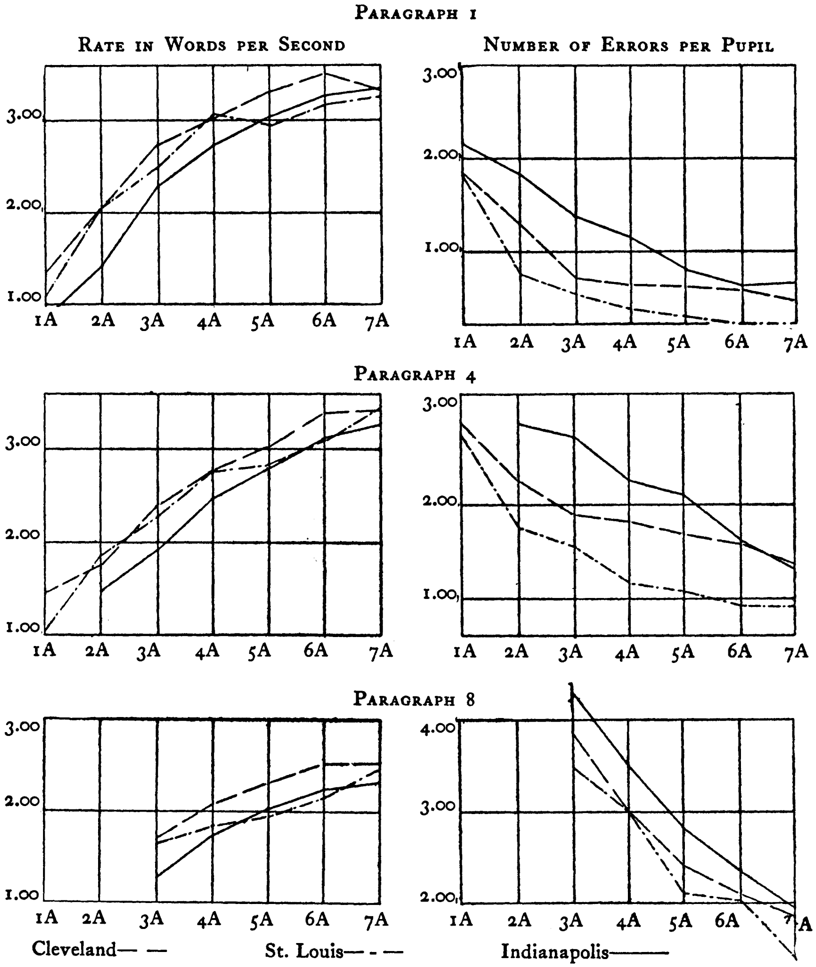

DIAGRAM 6. Average Rate and Accuracy in Oral Reading for Cleveland, St. Louis and Indianapolis.

the pupils of either Cleveland or St. Louis. Futhermore, St. Louis and Cleveland eliminate errors very rapidly in reading simple selections during the first three grades. Indianapolis on the other hand, eliminates such errors much more slowly

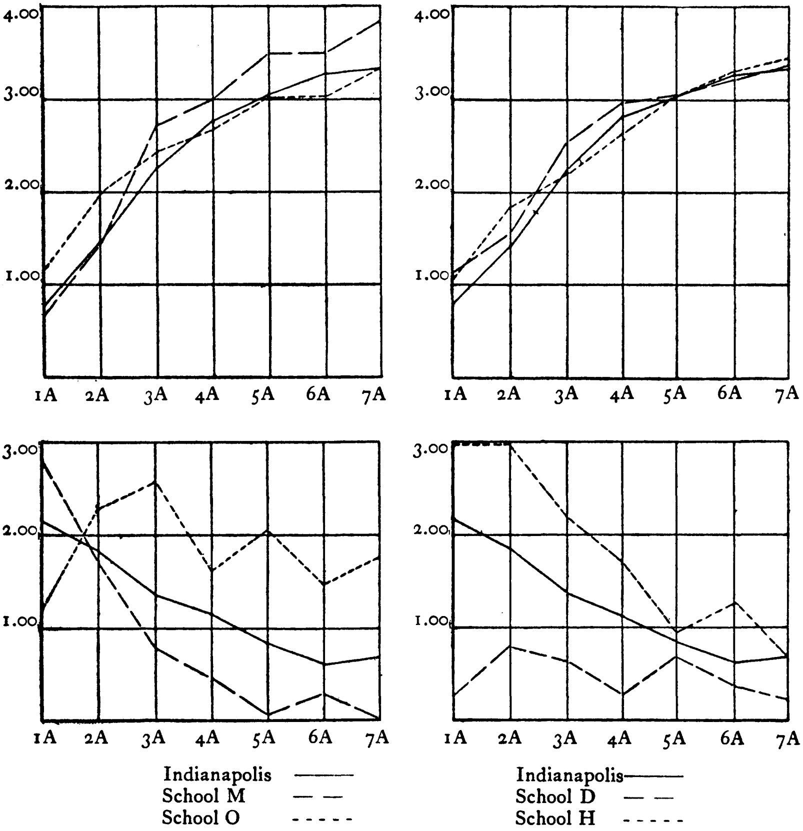

DIAGRAM 7. Average Rate and Accuracy in Oral Reading for Indianapolis and for Four Selected Schools.

during the same period. During the intermediate grades St. Louis is relatively free from simple inaccuracies, while fluency in Indianapolis, on the other hand, is unquestionably retarded by difficulties which should have been mastered much earlier.

The figures for paragraphs 4 and 8 show that the pupils of Indianapolis encounter more than the average number of difficulties in reading relatively difficult material.

In order to secure additional facts concerning the accuracy of oral reading in Indianapolis the records of four schools were studied in detail. The results for these schools in rate and accuracy in reading paragraph 1 are presented in Diagram 7. The upper figures of the diagram refer to rate and the lower figures refer to accuracy. The two left-hand diagrams should be studies together. In the upper left-hand diagram the average rates for two schools are presented. School M reads at about the average rate in the first two grades but gradually rises above the average in the intermediate grades and attains a high level in the upper grades. School O, on the other hand, reads somewhat more rapidly than the average in the lower grades but makes a less creditable record in the intermediate and grammer grades. The results for accuracy in the same schools are given in the lower left-hand figure. Surprising differences in attainment are revealed. School M encounters great difficulty in the first grade. It gradually overcomes its handicap, however, and makes noteworthy progress from that point on. School O, which makes a splendid record in the first grade, fails to give sufficient attention to the problem of accuracy beyond that grade. Equally striking contrasts in the character of the results which are secured are brought out in the right-hand figures of the diagram. Although School H and School D read at approximately the same rates throughout the grades there is a wide variation in the degree of accuracy attained, particularly in the first four grades. When the records of accuracy for Schools D, H, M, and O are compared, one is impressed with the need for more systematic instruction in the accurate recognition of words in some schools of Indianapolis.

The foregoing analysis of the results secured in Indianapolis may be summarized as follows: (1) The low oral-reading scores in the first four grades are due to difficulties encountered both in rate of reading and in accuracy. The major difficulties encountered, however, relate to the latter. (2) Simple inaccuracies which are eliminated in other cities during the first three grades occur frequently in the reading of the fourth, fifth and sixth grade children of Indianapolis. (3) Individual schools secure somewhat uniform results in rate of reading but vary decidely in accuracy. This wide variation in the results which are secured suggests the advisability of a careful study of the methods which are employed in the most successful schools to develop accurate and rapid recognition of words. The advisability of giving added attention to this phase of the reading problem was emphasized by frequent statements of supervisors and teachers to the effect that the methods for developing independence in the accurate recognition of words should be placed on a more systematic and uniform basis and that teachers should be trained to be expert along these lines. (4) The difficulties encountered by pupils in reading paragraphs 4 and 8, reveal the need for similar systematic training in the accurate pronunciation of words of three or more syllables. Phonetic analysis has been utilized to advantage in the lower grades in many city systems in aiding the pupils to recognize simple, unfamiliar words at sight. Effective methods of attacking polysyllabic words should be developed in the intermediate and grammar grades in order to enable pupils to pronounce at sight unfamiliar words of considerable length and difficulty.

RESULTS OF THE SILENT-READING TESTS

At the time that the pupils were tested in oral reading other tests were given to determime how rapidly they read silently and to what extent they understand what is read. These tests were given to all classes tested in oral reading above the 2 B sections. Tests appropriate to the grades to which the pupils belonged last spring were given in each case. Thus 3 B pupils, as classified at the beginning of the present school year, were given tests which would have been appropriate for 2 A pupils last spring.

The materials used in the silent-reading tests consisted of three short selections each less than three hundred words in length. These selections formed a series which increased in difficulty. The first was appropriate for second- and third-grade pupils; the second was appropriate for fourth- fifth- and sixth- grade pupils; and the third was appropriate for seventh- and eighth-grade pupils. The tests were given as individual

TABLE VI

AVERAGE RATES AND QUALITY SCORES IN SILENT READING FOR FIFTEEN SCHOOLS OF INDIANAPOLIS

SCHOOL	GRADES											
	2A		3A		4A		5A		6A		7A	
	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q
A	.92	30.1	1.57	35.5	2.03	12.0	2.82	19.9	4.87	22.1	3.16	15.5
B	1.04	24.8	1.29	29.5	2.05	11.5	3.00	14.6	3.14	27.6	3.37	17.5
C	1.22	35.7	2.00	42.2	2.40	20.9	2.77	27.1	3.55	31.2	3.44	21.2
D	.83	27.5	1.35	31.4	1.91	15.3	2.23	21.8	2.94	33.5	2.91	27.2
E	.83	23.1	1.51	34.0	2.07	17.4	2.25	20.4	2.63	32.7	2.42	24.5
F	.86	20.7	1.74	32.8	2.33	12.3	2.59	18.9	3.26	24.5	3.12	17.9
G	1.16	34.4	2.25	41.0	2.33	24.9	3.21	22.9	3.37	36.2	2.80	26.6
H	1.34	29.0	1.68	41.4	2.25	17.0	3.73	16.2	3.12	28.7	3.42	18.5
I	.95	29.2	1.80	41.4	2.12	24.5	2.27	24.9	3.57	38.2	3.75	26.2
J	.75	26.4	1.56	42.5	1.96	12.1	2.90	16.2	2.89	27.8	2.89	11.9
K	1.68	37.4	1.64	41.7	2.60	20.5	1.96	38.6	3.00	26.9	3.41	29.4
L	1.06	27.0	1.65	36.2	2.70	18.4	3.14	25.4	2.90	32.3	3.06	27.2
M	.95	25.2	2.57	39.0	2.30	23.1	2.72	20.5	3.43	34.9	3.40	18.9
N	1.12	22.4	2.15	36.0	2.76	18.3	2.19	26.8	3.23	38.2	2.97	17.0
O	1.10	24.8	1.79	30.0	2.25	17.0	2.80	23.0	3.14	30.1	3.03	17.7
Average	1.02	27.9	1.72	37.0	2.22	17.8	2.64	22.6	3.19	31.1	3.11	21.3

tests by the normal-school students. While the pupil read, the student who gave the test noted the number of seconds required to read the middle column of the selection. When the pupil had finished reading, he was given a sheet of paper upon which to write all that he could remember of what had been read. After completing the written reproduction, he wrote the answers to ten specific questions in regard to the content of the selection. In all cases below the 5 B sections, the students giving the tests wrote down the reproductions and answers to questions as the pupils dictated.

The silent-reading tests were scored in terms of rate and in terms of quality, or comprehension. The average rate at which a class read was determined by finding the average number of seconds required by the class to read one hundred words. This result was then expressed in terms of the number of words read per second. To determine the quality of a pupil's reading the reproductions and answers to questions were scored as follows: All wrong statements, all irrelevant statements, and all repetitions were checked from the pupil's reproduction and the remaining words counted. The percentage of the entire selection that these words formed was adopted as the reproduction score. For each question answered correctly a grade of ten points was given. The average of the reproduction grade and the grade received for correct answers to questions was found. This average grade was adopted as the quality score for silent reading throughout the investigation.

The average rate and quality scores in silent reading for each class tested are given in Table VI. The average scores for Indianapolis are given at the foot of the table. The average rate for a given grade was determined by finding the average number of seconds required by all of the pupils of that grade to read one hundred words. This result was then expressed in terms of the average number of words read per second. The average quality score was determined by finding the average of the scores made by all pupils of the grade.

Diagram 8, presents the average silent-reading rates of 1,831 pupils of Cleveland, 2,654 pupils of thirteen cities, 8,928 pupils of St. Louis, and 1,296 pupils of Indianapolis. A word of explanation is necessary in order that the diagrams may be readily understood. Since three selections were used

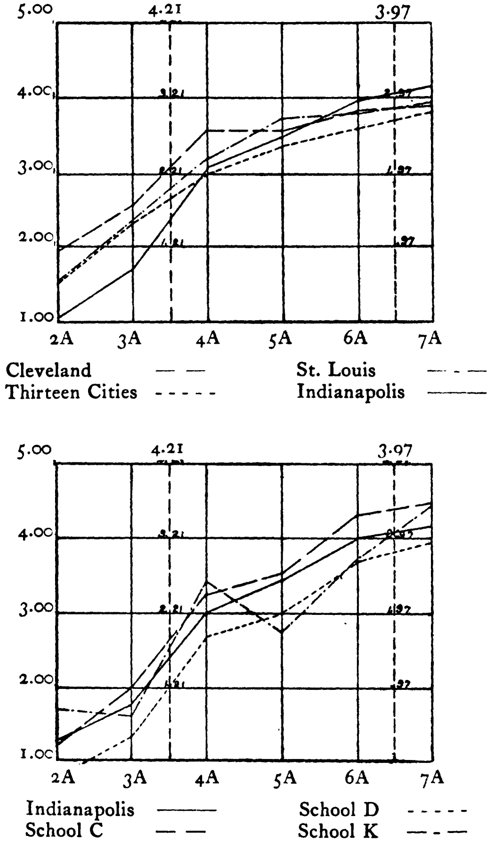

Diagram 8. Average Scores in Rate of Silent Reading for Four Cities and for Three Selected Schools of Indianapolis.

in the test, two readjustments have been necessary in the diagram. The points of these readjustments are between the third and fourth grades, and between the sixth and seventh grades. In Diagram 8, dotted vertical lines are drawn at each of these points. The numbers at the left of the diagram indicate the numbers of words read per second in the easy selection. The numbers on the line between the sixth and seventh grades indicate the equivalent number of words read per second when the most difficult selection was read.

The upper figure in Diagram 8, reveals two very interesting facts regarding the rate at which the pupils of Indianapolis read. In the first place, the record for Indianapolis is low in the second and third grades. This is in harmony with the results secured for rate in oral reading. It is not surprising that this should be the case inasmuch as rate of silent reading in the lower grades is necessarily related to mastery of the fundamentals of reading. As a rule the pupil who is able to read well orally can usually read rapidly to himself. On the other hand, the pupil who is unable to recognize simple words quickly encounters difficulty in silent reading. In the second place, the rate of silent reading increases rapidly in the fourth, fifth and sixth grades and reaches a distinctly high level in the upper grades. These results indicate that the upper grade teachers have adopted methods of instruction which secure superior results in rate of silent reading. The teachers of Indianapolis merit generous approval for this attainment.

The lower figure in Diagram 8 presents the records of three selected schools. School C secures results which are uniformly high throughout the grades while School D secures results which are just as noticeably low. School K, on the other hand, follows an irregular curve of progress. Pupils of the 3 A grade read somewhat slower than pupils of the 2 A grade. Pupils of the 5 A read noticeably slower than pupils of the 4 A grade. These results are significant when it is recalled that in each of the comparisons referred to above the groups of pupils which are compared read the same selections. The type of progress secured in Schools C and D is very desirable because it represents consistent progress from grade to grade toward a high level of achievement without loss of time or

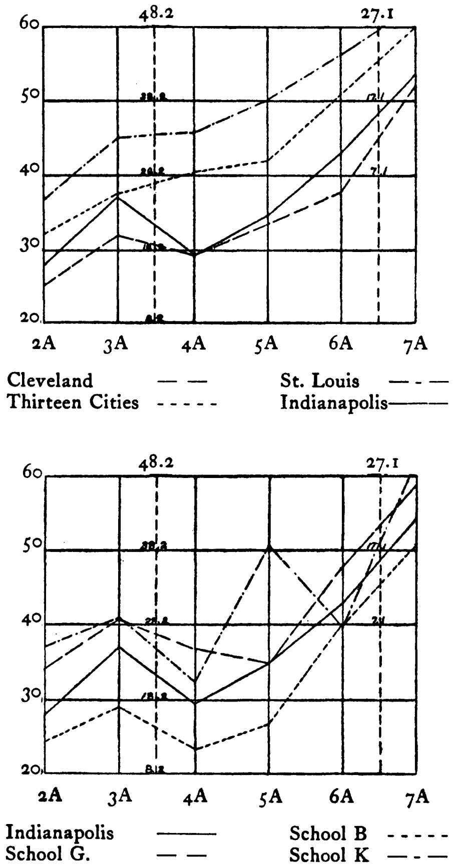

Diagram 9. Average Scores in Quality of Silent Reading for Four Cities and for Three Selected Schools of Indianapolis.

energy. Such schools set an example for other schools in which achievement is less regular and progressive.

The average quality scores of Cleveland, thirteen cities, St. Louis, and Indianapolis are compared in Diagram 9. The record for Indianapolis presents a striking situation. Second- and third-grade children do reasonably well as shown by the fact that they attain approximately an average score. Beyond that point, however, the record for quality is distinctly low, although at all points it is above the Cleveland record. The unusual break in the direction of the progress curve at the fourth grade may be due in part to the fact that the step of difference in difficulty between the selection used in the third grade and the one used in the fourth grade is slightly greater for Indianapolis than for the other cities. This assumption, however, explains only a minor part of the deficiency. It will be recalled that the fourth grade showed marked progress as compared with the third grade in rate of silent reading. A possible explanation suggested by this fact is that there has been a distinct change of emphasis in reading instruction in the fourth grade.

The lower figure in Diagram 9 presents the records of three selected schools. School G makes a distinctly superior record and School B makes a low record. School K makes very irregular progress and gives some support to the contention that differences in achievement may be due in part to difference in emphasis. By comparing the rate and quality for School K as presented in Diagrams 8 and 9, the following interesting facts are revealed: in the second grade both rate and quality is high; in the fourth and sixth grades rate is high and quality distinctly low. Such results suggest the desirability of initiating in each school a continuous series of reading investigations in order to avoid undue emphasis on certain phases of reading instruction at the sacrifice of progress in other phases.

In order to illustrate the type of information which each school should have available at all times for the purpose of self-criticism, the records of four schools are presented in Diagram 10. Records for oral-reading achievement, rate of silent

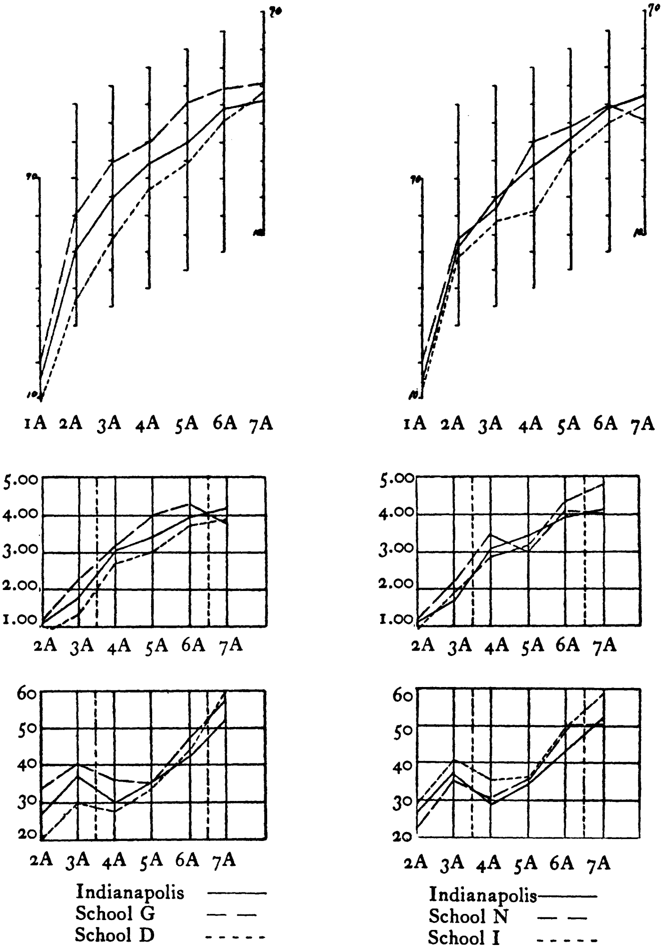

Diagram 10. Average Scores in Oral Reading in Rate of Silent Reading and in Quality of Silent Reading for Indianapolis and for Four Selected Schools.

reading, and quality of silent reading are included in the diagram. The number of phases of reading ability which are measured should be greatly increased during the course of time in order to secure a clearer insight and a truer perspective of the whole reading problem. A limited analysis, however, such as the one presented in Diagram 10, reveals some interesting facts. The left-hand column of figures in Diagram 10 shows that School G is uniformly high in all three phases of reading ability while School D is uniformly low with but few exceptions. Such comparisons suggest the desirability of locating in a city system the schools in which uniformly superior results are secured in order that less successful schools might profit from a careful study of the effective methods employed. The right-hand column of figures in Diagram 10 shows that School I is uniformly low in oral reading, low in rate in the lower grades, high in rate in the upper grades, and uniformly high in quality in all grades. School N makes an average record, or better, in oral reading, is relatively strong in rate of silent reading excepting in the fourth grade, and is low in quality in the second and third grades, and high in the fifth and sixth grades. Evidently School D is confronted with the problem of increasing the efficiency of instruction in reading along all lines. School I and School N have special problems which should be carefully studied in order to bring their achievement up to uniformly high standards. Objective studies of the type presented above make it possible to describe the needs of schools and individual pupils in clear, convincing terms. Inasmuch as Indianapolis now has a corps of thirty well-trained young women who can carry forward work of this type it is recommended that studies be continued throughout the year in a much more thoroughgoing way than has been possible in an initial study lasting but one week. The teachers in each school should assist in these studies to a very large extent, inasmuch as tests reveal most to those who give them. Additional suggestions in this connection will be made in a latter section of the report.

The facts which have been presented thus far in the report may be summarized as follows: (1) The aims of reading for each grade are not sufficiently differentiated from the general outcomes of reading instruction. Teachers attach large importance to comprehension in each grade and restrict emphasis on mechanics of reading to the lower grades. Appreciation of literature and oral-reading instruction are over emphasized, while too little importance is attached to improvement in study habits, and to training in the use of books. There is wide variation in the clearness with which teachers see the relation between means and results in reading instruction. (2) Indianapolis devotes a relatively small amount of time to reading instruction as compared with the average practice in fifty cities. There is evident need for increasing the amount of time given to reading in each grade. (3) There is a distinct tendency in the lower grades to decrease the percentage of time devoted to oral-reading instruction, and to increase the percentage of time devoted to silent-reading instruction. This tendency reaches a climax in the fourth grade where approximately 50 per cent of the time is devoted to silent reading. Beyond the fourth grade variations in practice increase noticeably. In some schools the percentage of time devoted to oral reading increases and the percentage of time devoted to silent reading decreases. (4) The oral-reading tests showed that at the beginning of the school year the pupils who were tested in Indianapolis ranked lower than comparable groups of pupils who were tested in other school systems. (5) An analysis of rate and accuracy in oral reading showed that the pupils who were tested read more slowly and much less accurately than pupils who had been tested in other cities. (6) The silent-reading tests showed that the pupils of Indianapolis read relatively slowly in the second and third grades, progressed rapidly in the intermediate grades and rose to a high level in the upper grades. In regard to quality of reading, the tests showed that the results for Indianapolis are distinctly below the average. (7) Various diagrams which were presented revealed wide variations in achievement among schools and illustrated the use of objective studies of reading in locating strong and weak points in a school system.